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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,059	01/17/2006	Yoshiaki Ohbayashi	0388-053673	4045

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EXAMINER	
ENSEY, BRIAN	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,059	OHBAYASHI ET AL.	
	Examiner	Art Unit	
	BRIAN ENSEY	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14,15,17-19,21,23,25 and 26* is/are rejected.

7)☒ Claim(s) *16,20,22,24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 14, 18, 21, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al. U.S. Patent No. 6,870,939 in view of Masatake et al. Japanese Patent Publication 08-095572.

Regarding claim 14, Chiang discloses a sound detecting mechanism comprising a pair of electrodes forming a capacitor on a substrate in which one of the electrodes is a back electrode (13,17) forming perforations therein corresponding to acoustic holes and (15) the other of the electrodes is a diaphragm (5,9), wherein the diaphragm is made of at least one of a metal film and a laminated film ((N-Si and PTFE), the metal film being formed by at least one of sputtering in a low temperature process, vacuum vapor deposition and plating technique, the laminated film being formed of an organic film (PTFE), a conductive film, **or any combination thereof**, the back electrode is formed on the substrate (11), and a spacer is formed from an organic film (polyamide, see col. 5, lines 13-17) for determining a distance between the diaphragm and the back electrode. Chiang does not expressly disclose the spacer is formed from part of a sacrificial layer. However, Chiang does teach the spacer is formed on the diaphragm module (1). The use of sacrificial layers as spacers in silicon based transducers is well known in the art and Masatake teaches a Si substrate and LB film to form organic spacers (See abstract translation). Therefore,

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the organic spacer of Chiang as taught by Masatake form a extremely thin formable spacer layer.

Regarding claim 18, the combination of Chiang in view of Masatake further discloses the organic film of the sacrificial layer uses at least one of a resist and polyimide resin for forming a void area between the back electrode and the diaphragm by etching the sacrificial layer See Masatake translation abstract).

Regarding claim 21, the combination of Chiang in view of Masatake further discloses the sacrificial layer has a thickness of 1 to 5 .mu.m (See Chiang col. 5, lines 15 and 16, spacer is 3 mu.m to 10 mu.m thick, therefore the sacrificial would be in this range).

Regarding claim 25, the combination of Chiang in view of Masatake further discloses a signal fetching circuit (12) formed on the substrate (11) and having a plurality of semiconductor elements, a sound detecting section formed of the diaphragm and the back electrode, and an electric connecting member (18) for transmitting signals from the sound detecting section to the signal fetching circuit (See Fig. 3 and col. 5, lines 22-24 and lines 43-47).

Regarding claim 26, the combination of Chiang in view of Masatake further discloses the electric connecting member is formed of at least one of metal wires (18) and a metal film (17) formed on the substrate in a semiconductor manufacturing process (See Fig. 3).

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Chiang in view of Masatake as applied to claim 14 above, and further in view of Tai et al. U.S. Patent No. 6,243,474.

Regarding claim 15, the combination of Chiang in view of Masatake discloses a sound detecting mechanism as claimed. The combination of Chiang in view of Masatake does not

expressly disclose the diaphragm is made of at least one of an Ni film or Cu film formed by plating technique, and stress of the diaphragm is controlled by setting processing conditions in executing the plating technique. However, the use of Cu and other metal film on a diaphragm is well known in the art and Tai teaches forming a Cu electrode as part of a laminated diaphragm (See col. 3, lines 14-19, applied by evaporation or deposited in other fashions), the stress of the diaphragm is inherently controlled by setting processing conditions in executing the plating technique. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to form a Cu laminate on the diaphragm of Chiang as taught by Tai.

Regarding claim 17, the combination of Chiang in view of Masatake discloses a sound detecting mechanism as claimed. The combination of Chiang in view of Masatake further discloses the diaphragm is formed of a lamination comprising abase layer made of an organic film using at least one of a resist, polyimide resin and polyparaxylene resin (See col. 5, lines 3-8). The combination of Chiang in view of Masatake does not expressly disclose a conductive layer made of conductive material (Cr/Au, Al or Cu). However, the use of a conductive layer made of conductive material on a diaphragm is well known in the art and Tai teaches forming a conductive layer made of conductive material (Cr/Au, Al or Cu). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to form a conductive layer made of conductive material on the diaphragm of Chiang as taught by Tai.

Claims 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Chiang in view of Masatake as applied to claim 14 above, and further in view of Takehide et al. Japanese Patent Publication 2002-223499.

Regarding claim 19, the combination of Chiang in view of Masatake discloses a sound detecting mechanism as claimed. The combination of Chiang in view of Masatake further discloses a silicon substrate. The combination of Chiang in view of Masatake does not expressly disclose the silicon substrate is a monocrystal silicon substrate, and a silicon substrate of 100 orientation is used as the monocrystal silicon substrate. However, the use of a monocrystal silicon substrate of 100 orientation used as the substrate in a microphone is well known in the art and Takehide teaches a monocrystal silicon of 100 orientation used as the silicon substrate in a condenser microphone (See translation abstract). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the substrate of the combination of Chiang in view of Masatake with the substrate of Takehide to provide a low stress diaphragm and enhance the safety in the manufacturing process.

Regarding claim 23, the combination of Chiang in view of Masatake in further view of Takehide further discloses an opening corresponding to a sound entrance is formed by anisotropic etching after the back electrode is perforated to form acoustic holes (See Takehide translation abstract).

Allowable Subject Matter

Claims 16, 20, 22 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 10/31/08 have been fully considered but they are not persuasive.

With respect to the applicant's argument that Chiang *fails to teach or suggest that the diaphragm is made of a metal film, a laminated film formed of an organic film and/or a conductive film, and that the spacer is formed from part of the sacrificial layer*, the Examiner respectfully disagrees.

The Examiner respectfully points to claim 14 where it states "wherein the diaphragm is made of at least one of a metal film and a laminated film ((N-Si and PTFE), the metal film being formed by at least one of sputtering in a low temperature process, vacuum vapor deposition and plating technique, the laminated film being formed of an organic film (PTFE), a conductive film, **or any combination thereof,"** and Chiang clearly discloses a diaphragm made of at least one of a metal film (8, Gold or Aluminum, see col. 4, lines 66 and 67) and a laminated organic film (9, PTFE, see col. 5, lines 3-7) along with a Silicon Nitride layer. The applicant claims "any combination therefo" therefore, the Examiner submits that Chiang meets these limitations.

With respect to the applicant's argument that the combination of Chiang in view of Masatake fails to teach or suggest *the spacer is formed from part of the sacrificial layer* and the spacer is formed *for determining a distance between the diaphragm and back electrode*, the Examiner respectfully disagrees.

Chiang teaches a spacer (10) to provide a vibrating space between the diaphragm and the backplate (See Fig. 3 and col. 3, lines 3 and 4) and therefore determines a distance by its very construction. Masatake teaches a spacer (4) is a sacrificial layer of extremely thin dimensions

disposed between the conductive metal layer and the substrate such that the sacrificial layer may be removed without damage to the substrate. Therefore, it would have been obvious to form the spacer of Chiang as taught by Masatake to provide the thin distance desired and prevent damage to the backplate by using the low melting organic matter layers of Masatake.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN ENSEY whose telephone number is (571)272-7496. The examiner can normally be reached on Monday - Friday 6:00 AM - 2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on 571-272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, Va. 22313-1450

Or faxed to:

(571) 273-8300, for formal communications intended for entry and for informal or draft communications, please label "PROPOSED" or "DRAFT".

Hand-delivered responses should be brought to:

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/Brian Ensey/
Primary Examiner, Art Unit 2614
January 27, 2009